UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

JUL 7 2011

ACTION MEMORANDUM – ENFORCEMENT

SUBJECT: Request for a Removal Action at the Radiation-Standard Products, Inc. (Former) Wichita, Sedgwick County, Kansas

FROM: Randy Schademann, On-Scene Coordinator
Planning and Preparedness North Section

THRU: Don Lininger, Chief
Planning and Preparedness North Section

TO: Cecilia Tapia, Director
Superfund Division

Site ID# A7N1

I. PURPOSE

The purpose of this Action Memorandum is to request approval and funding for a potentially responsible party (PRP)-lead, time-critical removal action at the Radiation-Standard Products (Site). The Site is located at 650 East Gilbert Street, Wichita, Sedgwick County, Kansas.

As detailed below, the objective of this removal action is to protect public health or welfare or the environment by responding to the release of hazardous substances and pollutants or contaminants into the environment as presented by materials contaminated with radium-226 at the Site. Contaminated materials that exceed 5 picocuries per gram (pCi/g) plus background will be excavated, transported and disposed of at a licensed facility.

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

1. Removal site evaluation

The Kansas Department of Health and Environment (KDHE) Bureau of Air and Radiation (BAR) licensed radium dial shops. According to BAR records, Radiation-Standard Products operated a facility repairing aircraft instruments from approximately 1952 to 1965. By 1965, the facility had relocated to 4105 West Pawnee and changed its name to Standard Precision, Inc.

Radium in luminescent paints was widely used for aircraft dials, gauges and other instruments. Radium dial repair shops were located in Wichita to upgrade and repair radium-bearing aircraft instruments. During this process, paint containing radium was stripped from the dials with solvent prior to the dials being repaired.

In an ongoing effort to evaluate these facilities, KDHE conducted field work in August, September and December 2007 to support a Unified Focus Assessment Report issued in February 2008. Five groundwater samples and 24 soil samples at the Site were collected for the Unified Focus Assessment (UFA). Samples were analyzed for radium-226; the eight Resource Conservation and Recovery Act metals (lead, arsenic, barium, cadmium, chromium, mercury, selenium and silver) and volatile organic compounds. The UFA Report identified several areas that had elevated radium concentrations exceeding the standard established at 40 CFR § 192.12 for a cleanup level not to exceed background plus 5 pCi/g (up to 81,800 pCi/g of radium-226). No samples were taken or field screening conducted at the 920 South St. Francis parcel during the KDHE's UFA, because the assessment was limited to the facility where dial work was thought to have occurred.

The U.S. Environmental Protection Agency (EPA) conducted field activities for a Removal Site Evaluation (RSE) in March and April 2009. Field screening with radiation detectors and radiation analysis of soil samples further defined the vertical and aerial extent of contamination. Results of the field screening depicting areas showing radiation above background values are provided in Figure 1.

During the EPA-lead RSE in March 2009, prior to the fund-lead removal action, it was determined that some radium-contaminated material from the Site had been moved to 920 South St. Francis, an adjacent residential parcel, which was the subject of an EPA-lead removal action in July 2009. During that effort, approximately 453,700 pounds of radium-contaminated material was excavated, transported and disposed of at a U.S. Ecology, Inc., facility in Idaho (the EPA Fund-Lead Removal Action, July 9, 2009, and START Removal Action Report, Standard Products, Inc. [Former] – 920 South St. Francis Parcel, Wichita, Kansas. March 11, 2010).

2. Physical location

The Site consists of three acres—the combined acreage of the 650 East Gilbert and 920 South St. Francis parcels in Wichita, Sedgwick County, Kansas. Both parcels are located in the Northwest ¼ of Section 28, Township 27 South, Range 1 East. However, the removal action for the 920 South St. Francis parcel was conducted by the EPA in July 2009. Adjoining properties include commercial businesses adjacent to the property to the south and north, railroad right-of-ways on the east and residential homes and a medical clinic to the west and southwest.

3. Site Characteristics

The East Gilbert parcel is largely vacant except for a metal building that is currently used for equipment storage by an electric company. The 920 South St. Francis parcel has a single family residence. The area surrounding the Site is primarily residential with some light industry, and the Guadalupe Clinic borders both parcels.

The EPA fund-lead Site removal was previously conducted at the 920 South St. Francis parcel by the EPA in the summer of 2009.

4. Release or threatened release into the environment of a hazardous substance, or pollutant, or contaminant

The primary contaminant of concern at this Site is radium-226. The EPA and KDHE have documented radium-226 concentrations in soil exceeding 5 pCi/g plus background (up to 81,800 pCi/g on the East Gilbert parcel being addressed by this removal action).

Radioluminescent paint—a mixture of a radionuclide, usually radium-226, and a phosphor, usually zinc sulfide—was developed in the early 1900s. The mixture was initially used on watch and clock faces and later adapted for use on instruments, most notably aircraft dials. As radium decays, it emits an alpha particle that can excite the phosphor which eventually releases a photon. The end results are dials that "glow" and can be read at night without light.

Radium has 25 known isotopes, four of which occur in nature, with radium-226, and to a lesser extent radium-228, being the most common. Radium-226 has the longest half-life at 1,602 years. Radium is a decay product of uranium and consequently is associated with uranium ores. Radium decays by emitting alpha and beta particles and gamma rays. Radium initially decays into radon, a heavy gas, which itself decays into other radioactive solids including polonium, bismuth, lead and thallium. Radium in soils does not biodegrade.

The workers at the East Gilbert parcel or passersby may be exposed via routes of inhalation or dermal contact from the radium-contaminated material, which is present at numerous areas at or near the surface. It also appears that the radium-contaminated material at the property is a source area for contamination of the area groundwater.

Exposure to high levels of radium results in an increased incidence of bone, liver and breast cancer. Radium, like calcium, is retained in bone tissue; bone cancer is the greatest risk from radium exposure. Death and decreased longevity have been reported as a result of long-term exposure. Radium has also been shown to affect the blood (anemia), eyes (cataracts), and teeth (increased broken teeth and cavities). Emitted ionizing radiation from the decay of radium and its daughters can lead to skin damage, hair loss, birth defects, general illness and cancer.

Radium-226 is a hazardous substance, as defined by section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and is listed at 40 CFR part 302.4 as radionuclides.

5. National Priorities List (NPL) status

The Site is not on nor is it proposed for listing on the NPL.

6. Maps, pictures, and other graphic representations

Figure 1 – Site layout and screening results is attached.

B. Other Actions to Date

1. Previous actions

Activities pertaining to the Site include:

- 1953-55, 1959, and 1962 – Kansas State Board of Health inspections.
- 2007 – KDHE UFA
- 2009 – EPA RSE
- 2009 – EPA Fund-Lead Removal at the St Francis parcel

There has been no known EPA or KDHE response action at the East Gilbert parcel to reduce the risks posed by radium contamination.

2. Current actions

There are no current actions being undertaken at the Site.

C. State and Local Authorities' Roles

1. State and local actions to date

On November 20, 2008, KDHE referred this Site to the EPA for a response action. The EPA is closely coordinating Site activities with KDHE and the Sedgwick County, Kansas Health Department. The EPA requested that KDHE state Applicable or Relevant and Appropriate Requirements (ARARs) on June 3, 2009, and KDHE responded on June 15, 2009. The Sedgwick County, Kansas Health Department volunteered to coordinate Site activities with the local governing bodies.

2. Potential for continued state/local response

Both KDHE and the Sedgwick County, Kansas Health Department will remain involved in future Site activities.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

Section 300.415(b) of the National Contingency Plan (NCP) provides that the EPA may conduct a removal action when it determines that there is a threat to human health or welfare or the environment based on one or more of the eight factors listed in section 300.415(b)(2). The factors that justify a removal action at the Site are outlined as follows:

300.415(b)(2)(i) – Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, or pollutants, or contaminants.

Analytical results from samples collected by the EPA indicate that hazardous substances have been released into the environment. Radium-226 was identified in soils at the East Gilbert parcel up to 81,800 pCi/g.

Radium is highly radioactive; it is classified by the EPA and the National Academy of Science as a known human carcinogen and is listed in 40 CFR § 302.4 as a hazardous substance (as radionuclides). Because radium is similar in structure to calcium, it tends to gravitate to boney tissue. Exposure to high levels of radium results in an increased incidence of bone, liver and breast cancer. Radium has also been shown to affect the blood (anemia), eyes (cataracts) and teeth (increased broken teeth and cavities). Emitted ionizing radiation from the decay of radium and its daughters (nuclides undergo spontaneous disintegrations that release energy and result in the transformation to a different atom) can lead to skin damage, hair loss, birth defects, general illness and cancer. The greatest risk to humans from radium is through ingestion of food and water contaminated with radium.

People using the health clinic and surrounding residents that are within 150 feet of the Gilbert Street property to the west, southwest and south are exposed to the risks described above by exposure to radium at the Site.

300.415(b)(2)(ii) – Actual or potential contamination of drinking water supplies or sensitive ecosystems.

In the samples collected by the KDHE in the UFA, radium was identified in on-site temporary monitoring wells at 156 pCi/L, which is above the Safe Drinking Water Act's Maximum Contaminant Level (MCL) of 5 pCi/L. Residents that developed a drinking water well could be exposed to the risks posed by radium.

300.415(b)(2)(iv) – High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.

Radium has been detected in surface soils up to 81,800 pCi/g. Radium-contaminated soils may migrate via airborne dusts, surface runoff, percolation into groundwater, construction activity, or children transporting soils/dusts into their homes after playing in the affected areas and foot traffic into residences.

The half-life of radium-226 is 1,602 years. It is highly probable that the Site will undergo physical changes during that time which would allow increased exposure.

The greatest risk to humans from radium is through ingestion of food and water contaminated with radium.

300.415(b)(2)(v) – Weather conditions that may cause hazardous substances, pollutants or contaminants to migrate.

Radium has been detected in surface soils up to 81,800 pCi/g. Radium-contaminated soils may migrate via airborne dusts at the East Gilbert parcel.

IV. ENDANGERMENT DETERMINATION

The actual release of a hazardous substance at the East Gilbert parcel, if not addressed by implementing the response action selected in this Action Memorandum, presents an imminent and substantial endangerment to the health of the public that comes in contact with the Site and to public welfare and the environment.

V. PROPOSED ACTIONS AND ESTIMATED COST

A. Proposed Actions

1. Proposed action description

SOIL/WASTE EXCAVATION, REMOVAL, AND REPLACEMENT

The discussion presented in the following two paragraphs is based upon a memorandum from the Director of the Office of Superfund Remediation Technology Innovation February 12, 1998, Directive number 9200.4-25.

Standards have developed for the cleanup of uranium mill tailings under section 275 of the Atomic Energy Act, 42 U.S.C. § 2022, as amended by section 206 of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), 42 U.S.C. § 7918, and regulations at 40 CFR § 192.12. Pursuant to the above, the purpose of these standards was to limit the risk from inhalation of radon decay products of houses built on land contaminated with tailings and to limit gamma radiation exposure to people using the contaminated land.

Subpart B of 40 CFR 192.12 lists two standards as cleanup levels for surface and subsurface soils. The cleanup level is not to exceed background level, plus the following:

- 5 pCi/g of radium-226 for surface soils, which is a health-based standard. The basis for the standard is the health risk caused by exposure to gamma radiation.

- 15 pCi/g of radium-226 for subsurface soils, which is not a health-based standard, but rather was developed for use in field measurements rather than laboratory analyses, to determine when buried tailings had been detected.

Because the soil contamination on the East Gilbert parcel is relatively shallow, mimicking the mill waste for which the UMTRCA of 1978 was developed, the 5 pCi/g plus the background concentration will be used throughout the Site. A background concentration of 1.87 pCi/g was developed as the mean of samples collected by KDHE and the EPA for an action level of 6.87 pCi/g.

All Site-sampling activities for comparison to the action levels will be conducted in accordance with an approved Quality Assurance Project Plan.

After removing the soils from the affected area, the excavated soils will be replaced with clean soils. Clean soils are soils that have been analyzed for radium, with results indicating that

the concentration is at or below the background and that all other hazardous substances, pollutants or contaminants are below residential soil screening levels as determined by the EPA, or as referenced in the Region 9 Preliminary Remediation Goal tables found at *http://www.epa.gov/Region9/waste/sfund/prg/index.htm*, or as outlined in the KDHE RSK Manual, Version 4, 2007.

The excavated material will be transported and disposed of at a licensed facility in accordance with all applicable local, state and federal requirements.

At this time, no post removal Site control will be necessary.

2. Contribution to remedial performance

The PRP-lead actions proposed in this Action Memorandum should not impede any future remedial plans or other response.

3. Applicable or Relevant and Appropriate Requirements (ARARs)

The following specific ARARs have been identified for this action:

Federal

- Occupational Safety and Health Act Standards at 29 CFR part 1910 will be applicable to all actions.

- Department of Transportation Regulations (DOT) at 49 CFR parts 107 and 171-177, DOT hazardous material transportation regulations, may be relevant and appropriate for transportation of the contaminated soils.

- The CERCLA Off-Site Rule promulgated pursuant to CERCLA section 121(d)(3), 42 U.S.C. § 9621(d)(3), and formally entitled "Amendment to the National Oil and Hazardous Substances Pollution Contingency Plan; Procedures for Planning and Implementing Off-Site Response Action: Final Rule," 58 Fed. Reg. 49200 (Sept. 22, 1993), codified at 40 CFR part 300.440.

- Section 275 of the Atomic Energy Act, 42 U.S.C. § 2022, as amended by section 206 of the UMTRCA of 1978, 42 U.S.C. § 7918; 40 CFR part 192, as previously described in Section V, Proposed Actions.

- 10 CFR part 61, particularly 10 CFR parts 61.7(a)(2), -61.41, -61.56, -61.81, Substantive requirements of the Licensing Requirements for Land Disposal of Radioactive Waste.

State

State ARARs will be developed by KDHE and evaluated for the Site.

4. Project schedule

Response activities are anticipated to begin within 90 days of the signing of this Action Memorandum. It is anticipated that the project will require approximately 40 days to complete.

B. Estimated Costs

The costs associated with this portion of the Radiation--Standard Products removal action are estimated as $1,086,769, which will be paid by the PRP.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Delayed action will result in a continued threat to public health or welfare or the environment.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. RECOMMENDATION

This decision document represents the selected removal action for addressing the hazardous substances, pollutants or contaminants present at the Site. The removal action was developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. This decision is based on the Administrative Record for the Site.

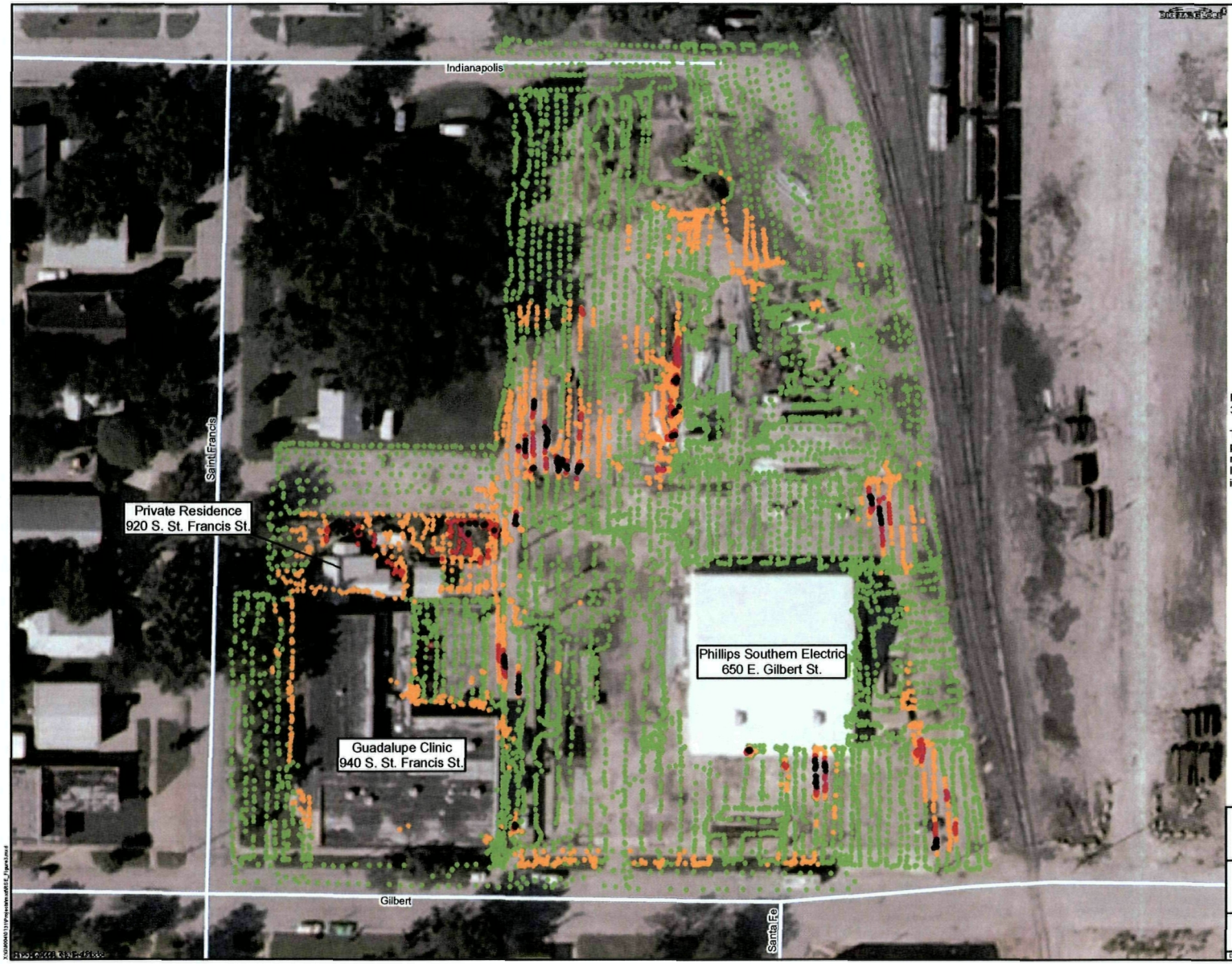
Conditions at the Site meet NCP section 300.415(b) criteria for a removal action, and I recommend your approval of this proposed removal action.

Approved:

Cecilia Tapia, Director
Superfund Division

7/7/11
Date

Attachment:
Figure 1: Site Layout and Gamma Survey Results



Legend

Gamma Survey Location

- < 17,659 cpm
  Below Investigation Level
- 17,659 - 31,794 cpm
  Investigation Level to 2x Background
- 31,794 - 47,691 cpm
  2x Background to 3x Background
- 47,691 - 63,588 cpm
  3x Background to 4x Background
- > 63, 588 cpm
  > 4x Background
- Local Road

cpm - counts per minute

Notes: Measurements were collected using a Ludlum 3x3 detector.

The Investigation Level is the mean of background readings plus 10 times the standard deviation of the background readings. Areas that exhibited gamma activity above the Investigation Level were subjected to additional investigation following the initial surface soil gamma survey.

N

30 0 30

Feet

Note: The Environmental Protection Agency does not guarantee the accuracy, completeness, or timeliness of the information shown, and shall not be liable for any injury or loss resulting from the reliance upon the information shown.

Source: RAT System Survey, March 2009
Image Connect, Globe Xplorer Premium Stack, 2008
ESRI Media Kit, 2007

Radiation - Standard Products, Inc. (Former)
Wichita, Kansas

Figure 1

Gamma Survey Results Map

TETRA TECH EM INC.

Date 07/24/2009 Drawn By Colin Willis Project No 103C9604.09013100